

list. In a further review of the taxonomic status of this group (1932) he reduced the total number to 13. More recently Rider and Macy (1947) described *H. ondatrae* bringing the total again to 14. Of these, only four species have 10 rostellar hooks. These were found to differ from *H. johnsoni* as follows:

H. cvaginata Barker and Andrews, 1915 (from *Ondatra zibethica* L.), has a strobila of much greater length (200–400 mm), a bilobed ovary, and smaller rostellar hooks (7 μ) of a characteristically different shape.

H. pearsei Joyeux and Baer, 1930 (from *Hybomys univittatus* Peters), has a larger cirrus sac (520 by 60 μ), testes arranged in a straight line, the ovary and vitelline gland poral to midline, and much longer rostellar hooks (60 μ) of a different shape.

H. muris-sylvatici (Rudolphi, 1819) (from *Apodemus sylvaticus* (L.)) has an aspinose cirrus and larger rostellar hooks (23 μ), which differ markedly in shape.

H. ondatrae Rider and Macy, 1947 (from *Ondatra zibethica occipitalis* (Elliot)), has a larger cirrus sac (30–35 by 150–220 μ), an ovary that is smooth or may tend to be trilobate, and rostellar hooks that vary in number from 8 to 10, are of a much greater length (67–73 μ), and have a distinctly different shape.

This cestode is named in honor of Dr. David H. Johnson, whose interest in these studies made possible the examination of valuable host material.

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ZOOLOGY.—*Geographical distribution of the species of nemerteans of the Arctic Ocean near Point Barrow, Alaska.*¹ WESLEY R. COE, Scripps Institution of Oceanography. (Communicated by Fenner A. Chace, Jr.)

Nemerteans occur along the borders of all the oceans, from beneath the Polar Seas northwest of Greenland (Coe, 1944) to the ice barrier surrounding the South Pole (Coe, 1950). Moreover most of the same genera, but not the same species, are found in both these extremes of latitude.

The floor of the Arctic Ocean near Point Barrow is evidently well adapted for populations of nemerteans, for Prof. and Mrs. George MacGinitie during their two years at the Arctic Research Laboratory² collected more than 300 specimens of these worms. Nemerteans were found at nearly all the dredging stations, from shallow water to depths of about 250 meters 12 to 16 miles from shore. The collections contained 24 recognizable species, among which are 7 species of *Amphiporus*, 4 of *Tubulanus*, 3 of

Micrura, 4 of *Tetrastemma*, 2 of *Cerebratulus*, 1 each of *Lineus*, *Emplectonema*, *Nemertopsis*, and *Paranemertes*. As in other collections from Arctic seas, the genus *Amphiporus* has not only the greatest number of species but some of the species have also the largest populations. *A. angulatus* and *A. lactiflores* are the most abundant species in the Point Barrow area. Ten of the species have not been reported previously from strictly Arctic seas, although three of these have been found in the nearby Bering Sea.

These collections are of particular interest because only three species of nemerteans were formerly known from that portion of the Arctic seas and the others contribute to an understanding of the circumpolar distribution of some of the species. Even at the present time no nemerteans are known from the Polar seas between the Point Barrow area and northwest Greenland on the east and Nova Zembya and Franz Josef Land on the west.

From the Polar seas the populations of

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several of the species extend southward along the European, American, and Asiatic coasts. *Cerebratulus marginatus* may be mentioned as a species with an unusually extensive geographical distribution, for the range of this species extends from near King Karl Land, Spitsbergen, and elsewhere in the Arctic to Norway, Great Britain, the Mediterranean and Madeira in the eastern Atlantic and from Greenland to Labrador, Nova Scotia, New England, Cape Cod, and farther southward beneath the offshore current in the western Atlantic. It also extends from the Point Barrow area, Bering Sea, Pacific coast of Alaska and southward to southern California along the American coast, and to Kamchatka and Japan on the Asiatic coast. This does not imply that the populations in the present geological era are continuous through all this vast extent of territory, nor can it be assumed that the species originated in that portion of the globe which is now occupied by the Polar seas. The species presumably exists as isolated, localized, more or less widely separated populations. Moreover it is probable that it is even more widely distributed than is at present known.

Four other species, *Lineus ruber*, *Cerebratulus fuscus*, *Amphiporus lactiflorus*, and *Tetrastemma candidum*, similarly extend southward along the European and American Atlantic coasts, while *Amphiporus angulatus* extends from Greenland as far south as southern New England in the western Atlantic and from Point Barrow to California on the American coast, as well as to Japan on the Asiatic coast, but it has not been found in the eastern Atlantic.

Amphiporus lactiflorus occurs on both the European and American Atlantic coasts, as well as in the Arctic, but has not been reported from the Pacific, while *Tubulanus capistratus* is found on both sides of the Pacific, from Point Barrow to California and to Japan, but not in the Atlantic. The Point Barrow area therefore forms an intermediate link for those species formerly known to occur in the Polar seas north of Europe or near the coasts of Greenland, or both, and those on either the American or Asiatic Pacific coasts or both.

Relatively few species of nemerteans are

known to occur in both the Northern and Southern Hemispheres. Of those here reported for the Point Barrow area, *Tubulanus annulatus*, *Lineus ruber*, *Cerebratulus fuscus*, and *Tetrastemma candidum* have been found also on the coast of South Africa and *Emplectonema gracile* on the coast of Chile.

The following list, arranged in systematic order, gives the geographical distribution of each of the species found in the Point Barrow area in so far as at present known. A similar list of the distribution of other species reported for Arctic seas has been published by Coe (1944).

Order PALEONEMERTEA

Tubulanus albocinctus (Coe), 1904. This is the first record of this species in Arctic seas. It has been dredged previously among red algae at depths of 100 to 200 meters off the coast of southern California. One specimen, about 107 mm in length, was collected at a depth of 65 meters between 4 and 5 miles from shore off Point Barrow.

Tubulanus annulatus (Montagu), 1804. This species is widely distributed on the eastern shores of the North Atlantic, from Norway and Great Britain to the Mediterranean; it has also been reported from the South Atlantic, near the Cape of Good Hope. In the Arctic it has been dredged near King Karl Land, off Cape Platen, and in the Karajek Fiord, Greenland, as well as off the northwest coast of Greenland (Coe, 1944). In the Point Barrow area it was found at depths up to 126 meters and up to 7 miles from shore.

Tubulanus capistratus (Coe), 1901. This species is closely similar to the preceding but is without the white band on the dorsal surface of the head. It has been found in the intertidal zone and below along the Pacific coast of Alaska and southward to Monterey Bay, Calif., and it is also reported from Japan. In the Point Barrow area it was collected at depths of 3 and 131 meters, from near shore and 12 miles out.

Tubulanus frenatus (Coe), 1904. One specimen was found near Point Barrow. Previously recorded only from southern California.

Order HETERONEMERTEA

Lineus ruber (O. F. Müller), 1771. Circumpolar; coasts of Siberia; Greenland; Norway and Great Britain to the Mediterranean, Madeira and South Africa; Labrador to southern New England;

Alaska to California. In the collections from the Point Barrow area only two specimens were assigned to this species. One of these was found near shore and the other at a depth of 136 meters 8 miles out.

Micrura alaskensis Coe, 1901. A common species in the intertidal zone and below along the Pacific coast of Alaska and southward to northern Mexico. Found also in Japan. In the Point Barrow area only four individuals were obtained. One of these was found near shore and the others 4 to 7 miles out, at depths of 50 to 65 meters.

Micrura impressa (Stimpson), 1857. Originally described from an individual dredged in Bering Strait. Later reported from Japan (Yamaoka, 1940). One specimen measuring 97 mm in length and 9 mm in width when contracted was found washed ashore at Point Barrow.

Micrura purpurea (Dalyell), 1853. Reported in Arctic seas northwest of Greenland, Karajak Fiord and Hinlopen Strait at depths of 45 to 115 meters (Coe, 1944). Common on European coasts from the intertidal zone to depths of 200 meters or more. One specimen was obtained in the Point Barrow area at a depth of 143 meters, 16 miles from shore.

Cerebratulus barentsi Bürger, 1895. The minor morphological features which have been thought to separate this species from *C. marginatus* have evidently resulted from different states of contraction of the head. Hence *C. barentsi* is no longer considered to be a valid species.)

Cerebratulus fuscus (McIntosh), 1873-4. This is a species with a very wide geographical distribution, for it has been reported not only from the coasts of Greenland and elsewhere in Arctic seas, but also from Norway and Great Britain to the Mediterranean, as well as South Africa and Florida (Coe, 1951). The single specimen collected in the Point Barrow area was dredged at a depth of 41 meters, 3.5 miles from shore.

Cerebratulus marginatus Renier, 1804. This species has the wide circumpolar distribution previously mentioned, being found on European coasts as far south as Madeira; on the eastern North American coasts it extends southward to Cape Cod and farther south beneath the offshore current; on the western North American coast southward to southern California and in the western Pacific as far south as Japan. In the Arctic it has been reported from King Karl Land, Bremer Sound, Hinlopen Strait, East Spisbergen, and northwest Greenland. In the Point Barrow

area it was found at depths of 61 to 222 meters, 5 to 12 miles from shore.

Order HOPLONEMERTEA

Emplectonema gracile (Johnston), 1837. One small specimen about 30 mm long and 1 to 2 mm in diameter after preservation was obtained in the Point Barrow area at a depth of 38 meters. This is one of the most widely distributed of all species of nemerteans, being abundant in the intertidal zone and below, on the northern coasts of Europe and southward to Madeira; on the coasts of Alaska to California and northern Mexico, and it has been reported also from Chile, as well as from Kamchatka and Japan. It has not been recorded previously from Arctic areas.

Paranemertes peregrina Coe, 1901. In many localities this is the most abundant nemertean in the intertidal zone along the Pacific coast of Alaska and southward to California. It has also been reported from the Aleutian Islands, Kamchatka and Japan. Only a single representative of this species was found in the Point Barrow area.

Nemertopsis gracilis Coe, 1904. Previously reported from Pugen Sound to northern Mexico. Only one specimen was dredged in the Point Barrow area.

Amphiporus angulatus (Fabricius), 1774. The collections indicate that this is the most abundant nemertean in the Point Barrow region. Because of the relatively large size of many individuals and their conspicuous coloration, it is unlikely that they would be overlooked by the collector. This species was found at 9 stations, where the depths were between 12 and 226 meters. The distance from shore varied from 2.75 to 16 miles. This species is widely distributed in Arctic seas, having been reported from near Greenland, Baffin Bay, Davis Strait, Labrador, Nova Scotia, southward to Cape Cod and further south beneath the offshore Arctic current. On the Pacific coast of North America it extends through Bering Sea, along the coast of Alaska and south as far as Point Conception, California. On the Asiatic coast it has been found on the shores of Kamchatka and Japan. It was collected by Stimpson (1857) in Bering Strait.

Amphiporus formidabilis Griffin, 1898. Previously recorded from Bering Island, Aleutian Islands, coast of Alaska and southward to Monterey Bay, California. Two specimens in the Point Barrow collections were dredged at depths of about 62 and 226 meters, 5 to 12 miles from shore.

Amphiporus groenlandicus (Oersted), 1844. This is another species that is widely distributed in Arctic seas, having been reported from both the eastern and western coasts of Greenland, from Hinlopen Strait, Barents Sea, and from the waters off King Karl Land, Jena Island, Franz Josef Land, and Spitzbergen at depths of 4 to 450 meters. The same or a closely similar species, *A. caecus* Verrill, also without ocelli, has been dredged at a depth of about 35 meters off the New England coast (Coe, 1943). *A. groenlandicus* was found in the Point Barrow area at depths of 40 to 247 meters and up to 12 miles from shore.

Amphiporus imparispinosus Griffin, 1898. This has been reported previously from the Bering Sea and it is abundant in many localities in the intertidal zone and below, along the coast of Alaska and southward to Ensenada, Mexico. The typical form, which has three pouches of accessory stylets is often associated with the variety *similis*, which has only two. The species was found in the Point Barrow area at depths of 37 to 104 meters and up to 7 miles from shore.

Amphiporus lactifloreus (Johnston) 1828. With the exception of *Amphiporus angulatus*, this species appears to be the most abundant nemertean in the Point Barrow area. The species was found at 13 stations, where the depths varied from 12 to 226 meters and at distances up to 12 miles from shore. It is widely distributed along the shores of the Arctic and North Atlantic oceans, extending southward to the Mediterranean Sea and on the American coast as far as Cape Cod. Except in the far north it occurs in the intertidal zone and in some areas to depths of 200 meters.

Amphiporus macracanthus Coe, 1905. This species is known only from the Arctic coast of Alaska, where it was collected as early as 1882 near Cape Smyth and at a later date at Wainwright Inlet (Coe, 1905). In the Point Barrow area it was found at depths of 38 to 53 meters and up to 4 miles from shore.

Amphiporus pacificus Coe, 1905. Previously dredged at depths of 70 to 180 meters in the Bering Sea and off the coasts of Washington and California. Collected in the Point Barrow area at depths of 9 to 226 meters and up to 12 miles from shore.

Tetrastemma aberrans Coe, 1901. Several specimens were dredged at depths of less than 40 meters. Previously known only from the coast of Alaska.

Tetrastemma bicolor Coe, 1901. Previously known only from Kodiak Island, Alaska. One individual was dredged at a depth of 50 meters about 3 miles from Point Barrow.

Tetrastemma candidum (Müller), 1774. Circumpolar; Greenland; Norway to Madeira; South Africa; Labrador to southern New England and southward to northern Florida; northern coast of the Gulf of Mexico; Alaska to California and northern Mexico. In the Point Barrow area the species was found at depths of 34 to 145 meters and up to 16 miles from shore.

Tetrastemma coronatum (Quatrefages), 1846. The collection from the Point Barrow area was accompanied by a colored photograph of an individual of this species that had been dredged at a depth of 50 meters, about 3 miles from shore. Common on European coasts and the Mediterranean. Reported also in Japan (Yamaoka, 1940).

All the specimens in this collection are in the U. S. National Museum.

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